

Amendments to the Claims

Please cancel Claim 63. Please amend Claims 54, 61, and 62. The Claim Listing below will replace all prior versions of the claims in the application:

Claim Listing

1-41. (Canceled)

42. (Previously presented) A method for determining nucleotide identity of at least one nucleotide position of a polynucleotide of interest, comprising the steps of;
- a) contacting said polynucleotide of interest with a population of single-stranded primers, wherein said single-stranded primers comprise an array of one or more sets of one or more oligonucleotides, wherein at least one set comprises at least two oligonucleotides that are substantially homologous but differ from each other by one base at their 3' termini, wherein the oligonucleotides of the array have known sequence and wherein each oligonucleotide is attached to a solid support at a known location, to form the array, wherein at least one oligonucleotide of the array hybridizes to said polynucleotide of interest immediately adjacent to each nucleotide position to be identified, generating template-single-stranded primer complexes;
 - b) subjecting said complexes to a single base extension reaction to extend each annealed primer by a terminating nucleotide, generating extended primers;
 - c) identifying each terminating nucleotide that has been added to each primer; thereby determining the identity of at least one nucleotide position of a polynucleotide of interest; and
 - d) removing the terminating nucleotides from the annealed primers after completed analysis to prepare the solid support for reuse.

43-53. (Canceled)

54. (Currently amended) A method of analyzing a polynucleotide of interest for the presence or absence of an altered region, comprising the steps of:

- a) annealing a single sample of the polynucleotide of interest to ~~a plurality~~ an array of n primers of N nucleotides in length, wherein ~~the primers~~ each primer is immobilized to a solid support at a known location, and has ~~comprise an array of immobilized, consecutive, single-stranded oligonucleotides having known sequence~~ [[s]], wherein a first primer of the array comprises 1 to N nucleotides, a second primer of the array comprises nucleotides 2 to N of the first primer plus nucleotide N+1, and the nth primer of the array comprises nucleotides 2 to the last nucleotide of primer n-1 plus nucleotides (N+(n-1)) such that ~~wherein each primer differs from the previous primer in the array by one base at the~~ [[3']] growing end, and wherein [[the]] primers of the array are capable of hybridizing successively along the polynucleotide of interest, generating a plurality of annealed primers;
- b) subjecting the plurality of annealed primers to a single base extension reaction to extend each annealed primer by addition of a terminating nucleotide to form a plurality of extended primers; and
- c) observing the identity of each terminating nucleotide ~~that has been added in step b) to each extended primer,~~

thereby analyzing the polynucleotide of interest for the presence or absence of an altered region.

55. (Previously presented) The method of Claim 54, wherein the single base extension reaction comprises subjecting the plurality of annealed primers to a reaction mixture comprising a polymerase and nucleotides corresponding to each of the four bases.

56. (Previously presented) The method of Claim 55, wherein the nucleotides corresponding to each of the four bases are mutually distinguishable.

57. (Previously presented) The method of Claims 55, wherein three of the four nucleotides are differently labeled.
58. (Previously presented) The method of Claim 57, wherein the three differently labeled nucleotides are fluorescently labeled.
59. (Previously presented) The method of Claim 54, further comprising analyzing a polynucleotide that is complementary to the polynucleotide of interest.
60. (Previously presented) The method of Claim 54, wherein the terminating nucleotides are dideoxynucleotides.
61. (Currently amended) The method of Claim 54, wherein ~~the length N of the plurality of primers~~ is between 7 and 30 inclusive.
62. (Currently amended) The method of Claim 54, wherein ~~the length N of the plurality of primers~~ is between 20 and 24 inclusive.
63. (Canceled)
64. (Previously presented) The method of Claim 54, wherein observing the identity and location of the terminating nucleotides comprises use of a charge coupled device or a photomultiplier tube.
65. (Previously presented) The method of Claim 54, wherein the terminating nucleotides are dinucleotides.